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High Power LEDs as an advantageous alternative to Xenon arc lamps for Long Path DOAS instruments.

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The Long Path Differential Optical Absorption Spectroscopy (LP-DOAS) technique is a well established method for measuring atmospheric trace gases. During recent years steady advances in light emitting diode (LED) technology have led to the applicability of LEDs as light sources for active DOAS instruments. LEDs represent a potentially very advantageous alternative to common thermal emitters for a variety of reasons including low cost, high durability, no risk of explosion and reduced power consumption. The spectral radiance of high power LEDs is of the same order of magnitude as that of xenon arc lamps. The need for stabilisation and its realisation will be discussed, including the possible design of a new, more portable LED-powered DOAS instrument. LEDs emitting in the visible spectral range were already used to measure NO_2 and NO_3. Both species play an important role in the chemical processes of the urban boundary layer. Here, first experiences with UV-emitting LEDs to measure further atmospheric trace gases (e.g. SO_2 and CH_2O) will be presented.